

Parent ROC
²⁴¹ Am
⁶⁰ Co
¹³⁷ Cs
¹⁵² Eu
¹⁵⁴ Eu
³ H
²³⁹ Pu
²²⁶ Ra
⁹⁰ Sr
²³² Th
²³⁵ U

Assumptions:

RESRAD BLD

entire floor, 4 walls and ceiling are sources

no removable/no dusts

no ingestion or inhalation pathways

time zero is max dose

receptor center of concrete room

Summary:

With the exception of Sr/Y-90, when modeled the same (RESRAD adjusted to match EPA models) for external exposure

Notes:

With the exception of Sr/Y-90 all total calculations are within an order of magnitude in difference.

With the exception of Sr/Y-90, Eu-152, Eu-154, and Co-60 Dose all total calculations are roughly within a factor of 3 or less:

For Co-60 BDCC and BPRG appear to differ in comparison to each other when compared to RESRAD BLD results.

The DCF differences are not the only differences in modeled doses.

While the DCF differences predict total dose differences fairly well for most nuclides there are a few which the expected

Contributing Progeny	Input Concentration (dpm/m ²)	Input Conversions	
		pCi/m2	pCi/cm2
	10,000	4504.5	0.45045
	500,000	225225	22.5225
^{137m} Ba	500,000	225225	22.5225
	500,000	225225	22.5225
	500,000	225225	22.5225
	500,000	225225	22.5225
^{235m} U	10,000	4504.5	0.45045
²²² Rn+D	10,000	4504.5	0.45045
²¹⁰ Pb+D	10,000	4504.5	0.45045
²¹⁰ Po+D	10,000	4504.5	0.45045
⁹⁰ Y	100,000	45045	4.505
	3,650	1644	0.164
²²⁸ Ra+D	3,650	1644	0.164
²²⁸ Th+D	3,650	1644	0.164
²³¹ Th	48,800	21982	2.198
Totals			

es the EPA and ANL models are within an order of magnitude difference.

s difference.

differences are significantly different.

Adult Worker				
RESRAD BLD Risk	RESRAD BLD Dose mrem	BPRG 3D Risk	BDCC Dose mrem	risk BPRG/RE SRAD
3.62E-08	5.74E-02	4.04E-08	5.63E-02	1.12E+00
3.68E-05	4.81E+01	1.08E-04	4.55E+02	2.93E+00
2.22E-05	2.91E+01	4.34E-05	55	1.95E+00
3.33E-05	44.1	2.56E-04	3.18E+02	7.69E+00
2.80E-05	36.9	2.17E-04	270	7.75E+00
NA	NA	NA	NA	
6.34E-07	0.874	1.40E-06	1.78	2.21E+00
3.50E-06	2.82	3.57E-06	4.65	1.02E+00
4.77E-08	5.99E-02	4.09E-11	1.26E-05	8.57E-04
1.27E-05	5.75	3.97E-06	3.45	3.13E-01
3.09E-06	4.26	6.83E-06	8.7	2.21E+00
	1.40E-04	1.72E+02	6.40E-04	1.12E+03

BPRG/DCC

3D model (entire floor, entire walls, and ceiling are sources)

no removable/no dusts

no ingestion or inhalation pathways

BDCC = mrem/yr thus X 25 for 25 years exposure

receptor center of concrete room

BDCC/RESRAD	MISC	Slope factor difference BPRG/RESRADBLD	DCF difference BDCC/RESRADBLD	Daughters BDCC/RESRAD
9.80E-01	Excellent agreement; note: avg location = greater risk and dose	Waiting for answer from Charley Yu on how RESRADBLD converts mass to area source for Heast. For Dose it defaults to the FGR 12 groundplane DCF. Assume same done for risk but need to verify.	7.94E-01	
9.46E+00	insignificant difference but note BDCC and BPRG sig different %		9.80E-01	
1.89E+00	insignificant difference		1.10E+01	9.87E-01
7.20E+00	Somewhat significant differences		9.89E-01	
7.32E+00	Somewhat significant differences		9.86E-01	
2.04E+00	Insignificant difference		8.35E-01	1.01E+00
1.65E+00	Excellent agreement, note avg location is less risk but more dose?		1.03E+00	included +D
2.10E-04	Significant differences		5.79E+00	2.08E+01
6.00E-01	Insignificant difference		9.44E-01	included +D
2.04E+00	Insignificant difference		1.01E+00	8.24E-01

This suggest another assumption or factor drives differences or potential error in formulas?

Reviewing 1st answer from Charley Yu to complete analysis. Have second question regarding risk.

